

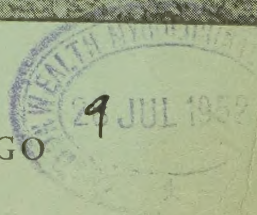
DEPARTMENT OF AGRICULTURE

WITH THE COMPLIMENTS
OF THE DIRECTOR
DEPARTMENT OF AGRICULTURE
TRINIDAD & TOBAGO

ADMINISTRATION REPORT 1950



COLONY OF TRINIDAD AND TOBAGO



COVER ILLUSTRATION : Sowing rice immediately prior to rains at the
Central Experiment Station.

ADMINISTRATION REPORT

OF THE

DIRECTOR OF AGRICULTURE

TRINIDAD AND TOBAGO

FOR THE YEAR 1950

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DEPARTMENT OF AGRICULTURE, TRINIDAD AND TOBAGO
SCIENTIFIC AND TECHNICAL STAFF

(As at 30th September, 1951)

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<i>Deputy Director (Crop Husbandry)</i>	...	C. HOLMAN B. WILLIAMS, M.A., A.I.C.T.A., D.I.C.T.A.
<i>Deputy Director (Animal Husbandry)</i>	...	H. V. M. METIVIER, O.B.E., M.R.C.V.S., B.Sc.
<i>Chief Scientific Officer</i>	...	B. G. MONTSERIN, Ph.D., M.Sc., B.S.A.
<i>Plant Pathologist</i>	...	E. B. MARTYN, B.A., A.I.C.T.A.
<i>Agronomists</i>	...	M. N. LUCIE-SMITH, M.A., B.Sc., A.I.C.T.A., Dip. D. M. HANSCHALL, B.Sc., A.I.C.T.A. L. L. DE VERTEUIL, D.I.C.T.A.
<i>Economic Botanist</i>	...	L. JOHNSON, B.Sc.
<i>Entomologist</i>	...	R. G. FENNAH, M.A., A.I.C.T.A.
<i>Soil Chemist</i>	...	VACANT
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<i>Superintendent, Public Gardens, Grounds and Pastures</i>	...	I. HOSEIN, B.Sc., D.I.C.T.A.

Manager, St. Augustine

Station ... R. ROSS

Senior Agricultural Assistants ... R. LEACOCK

S. HAGLEY

V. I. MULLOON, D.I.C.T.A.

D. M. FARRELL,

A. E. JOSEPH

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V. C. R. HENRY, D.I.C.T.A.

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1 VACANT

Agricultural Assistants

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M. A. LA CHAPELLE, B.Sc. (Acting)

Manager, Tobago Farm

... A. N. XAVIER

Supervisor, Trinidad Farm

... P. DOMINIQUE

Stock Inspectors ...

... D. MACFARLANE

L. PREUDHOMME

H. MOHAMMED

VACANT

Assistant Fishery Officer

... CAPT. R. E. HUNTE

Inspector of Apiaries ...

... E. A. EMOND

In addition there are ...

... 9 Field Assistants, Grade I

63 Field Assistants, Grade II

2 Senior Laboratory and Field Assistants

3 Scientific Assistants

2 Junior Scientific Assistants

COCOA BOARD

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<i>Officer-in-Charge, La Pastora Propagating Station</i>	... P. C. SCANTLEBURY
<i>Officer-in-Charge, Marper Propagating Station</i>	... F. RAPHAEL
<i>Officer-in-Charge, King's Bay Propagating Station</i>	... E. A. BLACK
<i>In addition there are ...</i>	... 7 Field Assistants, Grade I 7 Field Assistants, Grade II

MARKETING BOARD

<i>Assistant Marketing Officers</i>	... L. C. FARRELL F. A. RAWLINS
<i>Senior Marketing Assistants</i>	... W. A. FLOOK F. A. BAIN
<i>Marketing Assistants ...</i>	... J. FERNANDES J. GONSALVES C. HUTCHINSON
<i>In addition there are ...</i>	... 6 Depot Assistants, Grade I 10 Depot Assistants, Grade II

INTRODUCTION

FROM an agricultural viewpoint the year 1950 was reasonably satisfactory. There were substantial increases in production of most of the principal crops. Sugar production, however, showed a small decrease due to poor recovery and adverse weather conditions at harvest. Cacao prices remained high and exports increased by about twenty-five per cent. over the previous year. The citrus crop was good and the substantial increase in production as newer plantings attain maturity bids fair to rank citrus as a major crop. Coconuts and their derivatives were substantially higher than the previous year, while bananas and rubber made considerable advances. Although less coffee was shipped than in 1949, there was a marked increase in the value of the exports.

AGRICULTURAL POLICY

Implementation of the recommendations contained in the report of the Agricultural Policy Committee continues to be the main consideration. That Committee stressed the importance of investigational work by planned experiments as the basis from which accurate knowledge may be obtained for dissemination throughout the Colony. The most urgent needs, therefore, of the Department of Agriculture are the establishment of a properly equipped central experiment station on which specialist officers are resident, and facilities for the technical training of subordinate field officers to enable them to give full guidance to farmers in the districts.

2. Implementation of the composite scheme called for trained senior staff and for the necessary funds. Considerable progress may be recorded as most of the staff vacancies have been filled and funds were made available, during the year, from a Colonial Development and Welfare grant.

3. Preliminary work on the preparation of experimental fields has been extended considerably to include sugar cane variety trials and complex citrus experiments. Work of a capital nature is also being carried out and the conversion of the former Central Training Institute buildings into Laboratories and Offices is progressing satisfactorily.

4. To meet the demand for technically trained subordinate staff two "in-training" courses were afforded a number of the existing members as well as some recruits to the Service. These courses included lectures in the basic sciences by the Senior Technical Officers, as well as practical work in crop and animal husbandry at the St. Augustine Station and the Trinidad Stock Farm, respectively.

5. Demonstration Stations have been established at Rio Claro, Sangre Grande, Penal and at Louis d'Or in Tobago. Further progress in their development has been made and they continue to contribute as educational institutions and to return valuable data with regard to the behaviour of crops under conditions peculiar to the several districts. These stations are provided with livestock and illustrate the interdependence of animal and crop husbandry.

6. The main lines upon which agricultural policy continues to be directed are reproduced from previous reports and are as follows :—

- (i) To prevent the exploitation of the soil and to endeavour to improve its productivity under agricultural management.
- (ii) To encourage the production of local food crops bearing in mind the importance of nutritionally desirable foods both for man and livestock, to supply improved planting materials and to advise upon methods of production.
- (iii) To encourage the maintenance of livestock in increased numbers and of improved productive capacity in the interests of the improved nutrition of the people and of soil fertility and to conduct investigations towards these ends.
- (iv) To aid the established sugarcane, coconut, cacao and citrus industries by assistance in the supply of improved planting material and of technical advice based on the results of field experiments.
- (v) To prosecute investigations designed to expand the range and improve the quality of economic crops both for export and local consumption by field trials of indigenous and imported species.
- (vi) To encourage a healthy outlook on agriculture as a mode of life by the expansion of vocational education in agriculture and the creation of an informed extension service. To facilitate settlement on the land under secure tenure.
- (vii) To stimulate co-operation among agriculturists with the object of co-operative marketing and to provide a channel for the granting of financial assistance to productive enterprises.

AGRICULTURE IN THE COLONY

GENERAL CONDITIONS

7. Rain fell throughout most of the year and the total precipitation was above the average. Frequent and sometimes heavy showers caused intermittent flooding in low-lying areas from January to June. Appreciable damage was done to market garden crops and almost all of the dry season crops of the Oropouche Lagoon were lost.

8. The annual rainfall for a number of selected stations throughout the Colony and the monthly means for 1950, as well as for a 20-year average, are given in Tables I and II. These data have been kindly supplied by the Hydrologist of the Works and Hydraulics Department.

TABLE I—ANNUAL RAINFALL, TRINIDAD AND TOBAGO

Station						Total 1950, inches	20-Year Mean, inches
<i>North Trinidad</i>							
River Estate, Diego Martin	...	...	...	...	...	90.02	82.03
St. Clair Experiment Station, Port-of-Spain	...	...	...	...	...	71.44	68.31
La Pastora, Santa Cruz	...	...	...	...	...	107.70	88.76
I.C.T.A., St. Augustine	...	...	...	...	...	76.97	71.91
Meteorological Station, Piarcó	...	...	...	...	...	74.71	73.30
Frederick Estate, Caroni	...	...	...	...	...	96.37	87.74
Torreçilla Estate, Arima	...	...	...	...	...	85.39	—
Works and Hydraulics, Toco	...	...	...	...	...	92.55	81.48
Hollis Reservoir, Valencia	...	...	...	...	...	135.25	128.70
Bowline Estate, Sangre Grande	...	...	...	...	...	162.07	133.01
<i>Central Trinidad</i>							
Waterloo Estate, Waterloo	...	...	...	...	...	70.08	68.90
Todds Road Estate	...	...	...	...	...	80.38	78.52
Tamana Teak Plantation	...	...	...	...	...	129.78	120.78
McBean Estate, Couva	...	...	...	...	...	68.39	67.34
Forres Park Estate, Claxton Bay	...	...	...	...	...	64.12	61.91
New Lands Estate, Biche	...	...	...	...	...	131.41	116.53
Marper Farm, Manzanilla	...	...	...	...	...	111.58	105.16
Brasso Tamana Road	...	...	...	...	...	102.33	102.40
Cocal Estate, Nariva	...	...	...	...	...	85.49	—
<i>South Trinidad</i>							
Brothers Estate, Williamsville	...	...	...	...	...	89.69	85.07
Usine Ste. Madeleine, San Fernando	...	...	...	...	...	74.70	75.68
Perseverance Estate, Cedros	...	...	...	...	...	58.46	59.90
Poole Syndicate, Rio Claro	...	...	...	...	...	116.87	112.23
Point Fortin Filtration Plant	...	...	...	...	...	94.83	87.70
Trinidad Leaseholds Ltd., Barrackpore, Penal	...	...	...	...	...	79.77	75.74
Mayaro Police Station, Mayaro	...	...	...	...	...	111.59	96.17
Moruga Police Station, Moruga	...	...	...	...	...	72.96	72.21
Trinidad Leaseholds Ltd., Guayaguayare	...	...	...	...	...	93.20	88.72
Siparia Old Road, Fyzabad	...	...	...	...	...	68.31	65.38
<i>Tobago</i>							
Botanic Gardens	...	...	...	...	...	94.76	87.49
Government Farm	...	...	...	...	...	83.23	74.43
Friendship Estate	...	...	...	...	...	67.31	—
Hermitage Estate	...	...	...	...	...	97.32	97.45
Green Hill Estate	...	...	...	...	...	95.17	—
Kendal Estate	...	...	...	...	...	134.28	—

TABLE II—MEAN MONTHLY RAINFALL, TRINIDAD AND TOBAGO

Month						1950, inches	20-Year Mean, inches
January	...	...	...	...	...	8.39	6.24
February	...	...	...	...	...	8.29	5.12
March	...	...	...	...	...	3.60	2.84
April	...	...	...	...	...	3.54	3.26
May	...	...	...	...	...	5.40	5.84
June	...	...	...	...	...	15.90	12.62
July	...	...	...	...	...	10.07	10.01
August	...	...	...	...	...	11.68	11.32
September	...	...	...	...	...	5.54	6.64
October	...	...	...	...	...	6.33	6.86
November	...	...	...	...	...	7.94	8.46
December	...	...	...	...	...	9.07	8.90
TOTAL	...	...	...	...	...	95.75	88.11

9. The Labour supply was generally adequate with occasional local shortages in a few districts. There were no disturbances reported during the year.

AGRICULTURAL PRODUCTS FOR HOME CONSUMPTION

Crops

10. Interest in the production of green vegetables continues in Trinidad and appears to be awakening in Tobago. Unfavourable weather in the dry season (January to April) limited supplies in many areas while low lying areas were seriously affected. The weather, however, did not affect the starchy vegetables, and supplies, excepting for the normal fluctuations, were generally adequate.

11. The early maize crop (January to February) was satisfactory but subsequent crops during the year were poor as a result of wet weather.

12. Despite late planting, rice yields were fairly satisfactory. Milling, however, was rendered difficult, as the proper drying of padi was severely hampered by weather conditions.

Livestock

13. *Supply of Feeding Stuffs.*—Corn was again in short supply, due to poor crops, and coconut meal from the edible oil factories, the price of which was increased to 2½c. per lb. during the year, was not enough to meet the needs of stock owners. This position was somewhat relieved by the importation from the Leeward Islands of undecorticated cotton seed meal which was sold by the Marketing Division at 3c. per lb. Rice bran was again available but, on the other hand, molasses, which was in abundant supply early in the year at 7-8c. per gallon, became scarce soon after the end of the sugarcane harvest and the cost, due to world prices, was doubled at 14-16c. per gallon.

14. *Diseases.*—Thirteen outbreaks of swine fever more fully discussed in paragraph 139) reduced the supply of home-grown pork and hampered the movement of pigs.

15. The incidence of tuberculosis is discussed in paragraphs 136 and 137.

16. The occurrence of the poultry disease outbreaks listed in paragraph 149 adversely affected the supply of meat and eggs.

17. *Meat and Milk Production.*—No accurate data on meat and egg production are available, and it is known that appreciable numbers of poultry and small stock (pigs, goats and sheep) are slaughtered privately, but comparison of the following figures for slaughterings in 1950 (collected from municipal and Government-controlled abattoirs) with those in paragraph 19 indicates that the Colony is producing about half of its fresh meat consumption—fresh beef and veal, 30,000 cwt., fresh pork 22,500 cwt. As with meat, no complete production figures for milk are available but returns from 17 of the larger dairies indicate that they handle about 36,000 gallons per month.

18. *Importations.*—The animal imports are listed in Table III.

TABLE III—ANIMALS IMPORTED INTO TRINIDAD, 1950

Type	Source						No.	Total
<i>Animals</i>								
CATTLE	...	...	British West Indies	...	...	...	263	263 5,394 2,612 2,594
GOATS	...	...	British West Indies	...	...	...	5,394	
SHEEP	...	...	British West Indies	...	...	...	2,612	
SWINE	...	...	British West Indies	...	...	...	2,594	
<i>Animals for Breeding and Work</i>								
CATTLE	...	...	British West Indies	...	...	...	19	19
GOATS	...	...	United Kingdom	...	...	...	9	
			British West Indies	...	...	...	10	19
SHEEP	...	...	United Kingdom	...	...	...	4	
HORSES	...	...	United Kingdom	...	...	...	22	4
			British West Indies	...	...	...	21	
MULES	...	...	British West Indies	...	...	...	37	43
			Dominican Republic	...	...	...	20	
			U.S. Virgin Islands	...	...	...	21	
			United States of America	...	...	...	129	
								207

19. The imported fresh meat supply of the Colony was again chiefly from Australia in the form of frozen meat and can be summarized as follows :—

Fresh, chilled or frozen beef and veal

	cwt.	cwt.
United Kingdom	13	
Australia	35,428	
New Zealand	1,944	
Argentine	209	
United States of America	60	37,654

Fresh, chilled or frozen mutton and lamb

	cwt.	cwt.
Australia	1,044	
New Zealand	2,797	
Falkland Islands	4	
Argentine	18	3,863

Fresh, chilled or frozen pork

	cwt.	cwt.
Australia	251	
New Zealand	1,927	
Argentine	17	
United States of America	18	2,213

20. Outbreaks of swine fever in the Windward Islands markedly reduced the swine importations.

Apiculture

21. There were 214 registered apiaries at the close of the year with a total of 2,818 colonies.

22. Weather conditions were not favourable to honey production and yields were poor in some districts. The year's production returns showed a total of 91,809 lb. and exports amounted to 25,526 lb. Beeswax production totalled 1,735 lb.

AGRICULTURAL EXPORTS IN 1950

23. The value of agricultural exports continues to rise and substantial increases in most of the principal crops were made during the past year. The total values of agricultural exports during the past five years were :—

<i>Year</i>				<i>Total Value</i>
1946	...	...	...	\$12,351,877
1947	...	...	...	16,872,844
1948	...	...	...	26,806,254
1949	...	...	...	28,376,869
1950	...	...	...	33,737,832

24. Agricultural exports for 1950 are presented in the following table :—

TABLE IV—AGRICULTURAL EXPORTS, TRINIDAD AND TOBAGO, 1950

<i>Item</i>					<i>Quantity</i>	<i>Value</i>	<i>Value</i>
						\$	\$
<i>Sugar and By-Products</i>							
Sugar	...	...	...tons	...	123,552½	17,900,584	
Molasses	...	...	...cwt.	...	409,358	119,408	18,019,992
<i>Cacao</i>							
Raw Cacao	...	...	...lb.	...	16,197,928	8,360,678	
Cocoa Butter	...	...	...lb.	...	8,431	4,504	
Prepared Cocoa	...	...	...lb.	...	510	428	8,365,610
<i>Citrus</i>							
Lime Oil—Distilled	...	...	...lb.	...	6,534	66,851	
Lime Juice	...	...	...gal.	...	59,370	44,037	
Limes, Fresh	...	...	...lb.	...	5,823	836	
Grapefruit, Fresh	...	...	...No.	...	13,400,026	585,447	
Oranges, Fresh	...	...	...No.	...	9,668,707	196,588	
Canned Grapefruit Juice	...	...	...gal.	...	1,007,244	1,282,472	
Canned Orange Juice	...	...	...gal.	...	18,903	30,207	2,206,438
<i>Tonca Beans</i>	...	...	...lb.	...	189,639	224,973	224,973
<i>Rubber, Raw</i>	...	...	...lb.	...	20,124	16,535	16,535
<i>Coffee</i>							
Raw Coffee	...	...	...lb.	...	1,636,199	860,226	
Prepared Coffee	...	...	...lb.	...	57,101	41,372	901,598
Carried forward							29,735,146

TABLE IV—AGRICULTURAL EXPORTS, TRINIDAD AND TOBAGO, 1950—Continued

Item				Quantity	Value	Value
Brought forward ...					\$	\$
<i>Coconuts and Derivatives</i>						29,735,146
Copra	...	...cwt.	...	14,000	256,838	
Coconut Oil (unrefined)	...	...gal.	...	44,190	76,824	
Coir Fibre	...	...lb.	...	141,200	7,620	341,282
<i>Fresh Vegetables</i>	...	...lb.	...	497,392	76,450	76,450
<i>Fresh Fruit, Other Sorts</i>	...	...lb.	...	277,163	31,942	31,942
<i>Bananas</i>	...	...stems	...	70,986	163,398	163,398
<i>Peas and Beans</i>	...	...lb.	...	1,369	234	234
<i>Livestock and Hides</i>						
Livestock	...	...	...	—	33,884	
Hides	...	...lb.	...	310,163	43,904	77,788
<i>Honey</i>	...	...lb.	...	28,251	4,290	4,290
<i>Milk, Fresh</i>	...	...gal.	...	1,088	1,595	1,595
<i>Wine</i>						
In bottle	...	...liq. gal.	...	2,717	4,383	
In wood	...	...liq. gal.	...	11,406	15,822	20,205
<i>Spices</i>						
Nutmeg	...	...lb.	...	39,628	17,341	
Mace	...	...lb.	...	2,450	1,934	
Other Sorts	...	...lb.	...	1,077	429	19,704
<i>Syrup</i>	...	...lb.	...	1,965,387	143,845	143,845
TOTAL VALUE						\$30,615,879

25. The above table differs somewhat from the corresponding one published in previous years since it does not include the exports of manufactured agricultural products; these are shown in the following table :—

TABLE IVA—EXPORTS OF MANUFACTURED AGRICULTURAL PRODUCTS, TRINIDAD AND TOBAGO, 1950

Item				Quantity	Value	Value
<i>Sugar and By-Products</i>					\$	\$
Rum	...	...proof gal.	...	1,165,600	2,065,021	2,065,021
<i>Coconuts and Derivatives</i>						
Edible Oil	...	...gal.	...	96,651	203,429	
Margarine	...	...lb.	...	113,899	44,356	
Lard Substitute	...	...lb.	...	175,878	62,440	310,225
<i>Soap</i>						
Hard Soap	...	...lb.	...	578,728	90,481	
Stock Soap	...	...lb.	...	193,651	30,336	120,817
<i>Bitters</i>	...	...proof gal.	...	47,587	619,962	619,962
<i>Jam, Marmalade and Fruit Jellies</i>	...	...lb.	...	26,499	5,928	5,928
TOTAL VALUE						\$3,121,953

Sugar

26. The sugar output in 1950 amounted to 146,508 tons which was short of the previous year's record crop by 12,627 tons. Crop statistics for 1949 and 1950 are compared below :—

TABLE V—TRINIDAD SUGAR CROP STATISTICS

	1950	1949
Estates' canes ground, tons	885,818 (63.19%)	930,136 (64.67%)
Farmers' canes ground, tons	516,113 (36.81%)	508,109 (35.33%)
Total canes ground, tons	1,401,931	1,438,245
Sugar output, tons	146,508	153,890
Tons cane per ton sugar	9.57	9.05
Estates' area reaped, acres	31,322	29,874
Average estate cane yield per acre, tons ...	28.28	31.14
Estimated standover canes:		
Estates, tons	9,901	35,815
Farmers, tons	300	—
Price of Farmers' canes per ton	\$7.77	\$7.71

27. The crop was generally a good one but harvesting was retarded by unseasonable rains. Precipitation averaged 12.52 inches from January to April as compared with 4.99 inches over the same period in 1949. Froghopper attacks were severe during the latter months of the year but, as a result of effective control measures, damage was light.

28. Wage rates were increased by 12½ per cent. as from the commencement of the crop. Proposals by the Workers' Representatives on the Wages Council for the Sugar Industry for an increase in wages in 1951 were under consideration at the end of the year.

Cacao

29. There was a substantial increase in production despite unfavourable weather conditions and a high incidence of black pod disease (*Phytophthora*). Exports of raw cacao amounted to 16,197,928 lb. as compared with 12,831,728 in 1949.

30. Good prices were maintained and this has proved an incentive to salvage all formerly abandoned fields as well as to replant old fields with selected clonal material. As some of the earlier plantings of clonal cacao come into full bearing there is every indication that uniformly high yields may be expected. This also has been an important factor in quickening the pace of rehabilitation.

31. Exports and value of raw cacao for the last five years were as follows :—

TABLE VI—EXPORTS AND VALUE OF RAW CACAO, TRINIDAD AND TOBAGO

Year	Exports	Value
	lb.	\$
1946	6,626,962	1,171,781
1947	9,009,644	3,205,049
1948	18,285,605	8,353,312
1949	12,831,728	4,519,207
1950	16,197,928	8,360,678

Coconuts

32. Generally good crops were obtained as palms appear to have altogether overcome the effects of the severe drought of 1947. There has been a substantial increase in the value of exported coconut derivatives over previous years. The value of exports amounted to \$651,507 as compared with \$339,502 in 1949.

33. Maintenance work on coconut estates, both in Trinidad and Tobago, has been generally of a high standard, in many cases involving the use of mechanical cultivators. The rotary hoe has been the most favoured machine for weed-control, but disc harrows are now also finding application. Increasing incidence of Red Ring disease in young palms is tending to create a problem in regard to replants. Greatly increased losses from Red Squirrels and Rhinoceros Beetles have also been in evidence in the Cedros-Icacos district, which is the main coconut producing area of the Colony.

Citrus

34. Good crops of grapefruit and oranges were obtain but the lime crop was poor. Citrus is fast becoming a crop of major importance as more fields come into production. The impetus given to this industry by provisions under the Cacao Rehabilitation Scheme, which permits the substitution of alternative crops, is obvious in the field and the value of exports for 1950, amounting to \$2,206,438, as compared with \$1,163,969 in 1949, bears further testimony.

35. The Co-operative Citrus Growers' Association produced 515,400 cartons of juice from the 1950 crop and exported 144,561 cases of fresh fruit. Of the juice produced, 472,976 cartons were exported and 42,424 cartons consumed locally.

36. Orange and grapefruit cultivations remain free from serious pest and disease problems. There are also indications of better cultural standards on the larger estates. New plantings continue, and a steady expansion of the industry may be expected during the next few years. While new plantings are made largely at the expense of uneconomic cacao and with the aid of Cacao Subsidy funds, it is worthy of note that citrus has recently been substituted for cane in an area where transport costs are high, and for coconuts on an estate subject to severe Red Ring disease.

37. The lime crop continues to diminish, due mainly to progressive reduction of the seedling population by epidemic die-back, and, to a lesser extent, to withertip disease. Work by this Department indicates that budded limes on suitable rootstocks are immune or highly resistant to epidemic die-back, and this fact, coupled with present high prices for lime-products, has led some growers to replant on a fairly large scale. Such new plantings have been, or are being made, chiefly in the Erin, Mayaro, and Toco districts. It seems likely that the lime crop will for some years continue to diminish as seedlings die, but a revival can be expected in a few years time as budded plantings come into bearing. Tobago seedlings remain free of epidemic die-back, but cultural standards are generally low.

Other Crops

38. *Coffee* prices were higher than usual and the export value increased considerably, amounting to \$901,598 as compared with \$538,302 in 1949 for a larger crop.

39. *Bananas* showed a substantial increase as export figures indicate—\$163,398 in 1950 as compared with \$62,027 in 1949.

40. *Rubber*-tapping was in evidence towards the end of the year, due no doubt, to improved world prices.

WORK OF THE DEPARTMENT OF AGRICULTURE

41. There was considerable improvement in the position as regards senior technical staff posts and towards the end of the year only a few vacancies existed. There is still some difficulty in filling vacancies in the subordinate field staff due to a lack of trained personnel. In-training classes are conducted for recruits, as the occasion arises, before assignment to district work.

42. Only brief summaries of the work in hand are given below and enquiries seeking further details are invited.

EXTENSION

43. The Department's Extension Services offer the following :—

- (a) General advice to the public in agriculture;
- (b) Inspection visits to school gardens for advice and judging in connection with the Annual Competition;
- (c) Supervision of over 10,000 acres of food gardens;
- (d) Inspection of Crown Lands and interviews with applicants requesting leases for agricultural purposes;
- (e) Assistance and support to agricultural organizations, agricultural exhibitions and livestock shows;
- (f) Supervision for the district breeding units;
- (g) Supervision and management of district demonstration stations;
- (h) Parasol ant nests destruction on Crown Lands;
- (i) Plant Protection Service.

44. In addition they collect data for Crop Surveys and any information in the districts required by the Agricultural Department.

SOIL CONSERVATION

45. A short course of training in soil conservation principles and practice was organized for the Extension Service Staff and agricultural trainees.

46. Small plots demonstrating erosion control practices and proper land use were established at two of the agricultural settlements.

47. Efforts of the Extension Staff were focussed on the incorporation of soil conservation principles in the lay-out of school gardens.

48. It is proposed to establish sample run-off investigation plots in order to determine wasteful land use practices and suitable remedial measures.

CROPS

49. *Central Experiment Station.*—Field work included further clearing, preparing and planting of experimental plots for sugarcane and citrus investigations. Rotations and testing of new introductions of field crops, fibres and fodder crops were continued.

50. Maintenance work was continued on the old citrus fields which have benefited considerably as a result of improved cultural treatments. This is especially noticeable where leguminous cover crops have been established.

51. A full range of mechanical equipment to meet the needs of the Station has now been acquired and further experience was gained in the use of various implements in the field operations and in the maintenance of orchards, roads and traces.

52. Further progress in the development of the Station was made during the year and with funds becoming available for capital expenditure, through a Colonial Development and Welfare grant, the completion of the laboratories and offices was started and building sites for senior staff quarters were prepared.

Cacao

53. *Clonal Propagation.*—At La Pastora, 203,000 clonal plants were produced for distribution. The new open-bin continuous-spray method was continued during the year and additional units were constructed. Experiments were also started on less expensive constructions for small scale production on cacao estates with a view to decentralization. Such a course would solve the problems, presented at the moment, of scarcity of soil and nursery space and would considerably reduce the cost of distribution.

54. Marper Station produced 51,000 plants, 40 per cent. of which were of the witches' broom resistant clones SCA. 6 and SCA. 12. The Surinam clone CC. 7 was also propagated and all plants produced have been entered in the nursery plots.

55. The King's Bay Station, in Tobago, produced 20,000 plants and can now take care of the annual requirements of Tobago.

56. Two other propagators on privately owned estates were re-opened and operated to meet the needs of these estates.

57. *Diseases.*—Routine control of witches' broom disease, by excision of infected tissues and burying them at the two peak periods, remains the only satisfactory means of keeping down infection. Clones resistant to this disease are under study, and hybridisation between immune and high-yielding types is being carried out. Seedlings from several crosses are now undergoing tests for resistance to the disease.

58. Cacao virus is known to be widespread in the Western portions of the Northern Range and, in addition, isolated cases of the disease have been found in other parts of the Island, notably near Sangre Grande, all traceable to infected planting material distributed from River Estate before the disease was recognized. The disease now appears to have been eradicated in all these latter areas, with the exception of one cacao field near the Tompire River, Toco, where virus was found during the year.

59. *Pests*.—An island-wide outbreak of thrips (*Selenothrips rubrocinctus* Giard) occurred during November and December. Incidence was heavy only locally and damage was nowhere severe. In a location unfavourable to growth of cacao, differences between clones in tolerance of thrips injury show up unmistakably. For example, I.C.S. 1 proved much more susceptible than I.C.S. 95 adjoining.

60. On young cacao in the nursery, outbreaks of an aleyrodid white fly and a diaspine scale-insect were reported. Both were readily controlled by oil emulsion sprays.

61. *Shade Trees*.—In the Montserrat Hills where the Anauca Immortelle (*Erythrina micropteryx*) is extensively used as permanent shade for cacao, this species is affected by peculiar “witches’ broom” galls that appear extensively on the limbs of the trees and eventually kill them. The disease seems to be confined to this area. No organism has been shown to be responsible for this condition and experiments have been started to test its possible virus nature.

62. *Quality Sampling*.—Further efforts were made to develop a satisfactory technique for processing small quantities of cacao beans so that clonal cacao may be evaluated at an early stage before being planted out in quantity. Many samples were submitted to a panel of British Chocolate Manufacturers for flavour and quality assessment.

Sugarcane

63. The work of the Sugar Agronomist during the year was concerned with :—

- (1) The development of the area allocated to sugarcane at the Central Experiment Station;
- (2) Field experiments and weed control investigations;
- (3) Statistical work in connection with the analysis of field experiments and the determination of the price of farmers’ cane;
- (4) The preparation of the cane yield survey.

64. In addition to the multiplication of new varieties and the distribution of planting material, satisfactory progress was made with the development and planting of the sugarcane area at the Central Experiment Station, Centeno.

65. At the beginning of the year approximately 30 acres were under cane. Fifteen acres were cultivated and planted during the year and a start was made with the preparation of a further 25 acres to be planted in 1951. Plantings made, during the year, consisted of the establishment of two variety trials, and the extension of multiplication plots of varieties of the B.43’, B.44’, B.45’, B.46’, B.47’, B.48’ series and the Mauritius varieties M. 112/34, M. 134/32, M. 213/40 and M. 423/41 which were received from the Central Plant Quarantine Station.

66. Approximately 20,000 cane plants of the newer varieties were distributed to the sugar estates and to the Imperial College of Tropical Agriculture.

67. Nineteen and a half acres of advanced plant cane—B. 4098—were reaped and yielded 365 tons. The cane was cut and transported by contract at \$2.80 per ton.

68. *Insect Pests*.—Control of sugarcane froghopper by treatment of the base of the stool with chlorinated hydrocarbon insecticides achieved a high level. After suppression of the first brood by such means no appreciable emergence of second and

third broods occurred. There is good reason to consider that the stage has been reached where attention may usefully be turned to mechanizing the dusting of the stool-base.

69. As opportunity afforded, the study of the sugarcane froghoppers of the mainland was continued.

70. The Cuban fly (*Lixophaga diatraeae* Towns.) and the Amazon fly (*Metagonistylum minense* Towns.), liberated on certain estates under the auspices of the Commonwealth Bureau of Biological Control, had not made appreciable headway by the end of the year. Towards the end of the growing season, the principal local parasite, *Paratheresia claripalpis* V.d.W., became abundant in one small area where an unusually high infestation by *Diatraea* had been noted.

71. On one estate where rhizocine mealy-bugs in association with an ant of the genus *Acropyga* had in previous years been reported as responsible for damage to roots of ratoon cane, it was found that ground-surface treatment with chlordane was superficially effective everywhere, but that effectiveness below the surface was determined largely by the texture of the soil. Whether treatment was applied or not the attacks ceased with the death of old roots, and were not resumed on the roots produced subsequently. Transplanting and cross-infestation tests have given no support to the view that such outbreaks are primary, but suggest that they are able to develop only on roots growing in suboptimal conditions. It is thought that, in the heavy-soil areas of the northern sugar-growing estates, high or sustained rainfall on soil which has lost its tilth is one, if not the major, factor in producing such conditions.

72. In one locality substantial damage to recently planted seed-pieces was caused by larvae of the Palm Weevil (*Rhynchophorus palmarum* L.), accompanied by *Metamasius* sp. and termites. Some damage to young tillers was caused by mole-crickets, principally in lighter soils, but they were readily controlled by the method used against nymphal froghoppers.

Citrus

73. *Epidemic Dying of Limes*.—Evidence, so far, points to the probability that epidemic die-back of limes is a root-disease specific to the West Indian lime and that it may be avoided by the use of plants budded to immune root-stocks. It has long been thought that budded plants were less susceptible than seedlings but investigation has shown that unsuitability of the area or neglect of proper orchard methods are the truly important factors. Indeed, limes budded on sour orange stock, which is partially incompatible, are just as susceptible as seedlings to adverse conditions. The Tristeza virus has been shown to be the cause of a somewhat similar epidemic in seedling limes in West Africa; but Tristeza has not been reported in Trinidad and, moreover, certain of the characteristic Tristeza symptoms in limes, notably vein-clearing in the leaves and pitting of the stem and branches, do not occur in the local disease. A possible fungal pathogen has been isolated from diseased trees, and inoculation experiments are in progress—this work is being carried out in collaboration with the Plant Pathologist and the Colonial Microbiological Institute. It has been noted that the disease is more severe on acid soils than on those with a comparatively high calcium status.

74. Field plots have been laid down in various localities to test transmissibility of the disease by buds and grafts.

75. A greenhouse experiment has been started with potted seedlings to investigate (a) transmissibility of any possible virus by bud-grafts and by insects; (b) the effect of nutrients and soil-reaction; (c) the effect of the soil micro-population; (d) the possibility of accumulation of toxic material in the soil and (e) the effect of varying water status. Results should be available by the end of 1951.

76. On the La Reunion section of the Central Experiment Station, a rootstock, fertiliser, and shade trial was planted in 1946 with the object of observing the effect of treatments on disease. In the light of present knowledge, this can now serve no useful purpose. In any case, the area is subject to such severe withertip as to almost inhibit any growth. This experiment is now abandoned.

77. On the El Carmen section, a small observational trial was planted in 1948 including seedlings, limes budded onto lime roots, and limes on various other rootstocks. Up to last year practically no growth was made, due to severe scale and withertip. The former condition has been corrected by windbreaking, and the latter is being alleviated by regular sprays of copper fungicides. It is hoped that this plot will, apart from its main purpose, serve to produce data on the economics of controlling withertip by spraying. The plants have not yet reached the age when epidemic die-back usually makes its appearance; but it is hoped that, at a later period, the plot will confirm present theories by showing that the disease is confined to the seedlings and the plants budded onto lime stocks.

78. A manurial trial was laid down in 1947 on a field of budded limes on Sour Orange stocks at the Mausica Estate. At that time the limes in question, being unthrifty, were thought to be affected by epidemic die-back, and it was intended to investigate the possibility of the cause being nutritional. Since 1947, yearly applications of various combinations of N, Mg, Zn, Mn, PK, and mulch have been applied. There have been no observable differences between treatments. Last year all trees were pruned, the area windbreaked, and a leguminous cover-crop established. Since the establishment of minimal horticultural care, all trees, irrespective of manurial treatment, have attained a healthy appearance. This plot is being maintained in order to demonstrate that budded limes are not subject to the same epidemic disease as seedlings, and can be maintained in healthy condition if given the same attention normally accorded to orange and grapefruit orchards.

79. Leaf-injections with nutrient solutions were carried out in lime-growing areas. In the cases of both healthy and affected limes the only responses obtained were to N.

80. *Grapefruit Collapse on Sour Orange Stock.*—It has not yet been shown that this condition is transmissible by bud or graft. Observation in the field would seem to indicate that it is communicable, since several instances have been seen of the disease subsequently appearing in trees immediately adjacent to the one originally affected. Histologically, the disease appears to be characterised by reduction in functioning phloem in the stock below the union accompanied by hyperplasia of the rays. A few budded orange trees with similar symptoms, which were examined, also showed hyperplastic rays. Specimens were submitted to Dr. Schneider, of the

University of California Citrus Experimental Station, who confirmed that the histological pattern was not that of Quick Decline or Tristeza. Further work in this regard has been taken over by the Plant Pathologist.

81. *Rootstock and Management Trial*.—Land has been prepared for a long-term rootstock and management trial to be planted in 1951. This consists of a 5 x 5 Latin square with Limes (seedlings, and on stocks of bittersweet orange, sweet orange, rough lemon, and Dominica wild grapefruit); and two 6 x 6 Latin squares with Marsh grapefruit and Valencia oranges respectively on sour orange, sweet orange, Dominica wild grapefruit, rough lemon, Sampson Tangelo, and Cleopatra Mandarin stocks. In each case, seedlings, stocks, and scions are from a single parent of the particular variety.

82. Superimposed on the Latin squares of the rootstock trial is a split-plot experiment designed to compare the following management treatments:—

- (i) Wet season leguminous cover and dry season tillage (*Crotalaria* and rotary hoe);
- (ii) Non-tillage, weed-free system, using herbicides;
- (iii) Perennial leguminous cover crop (kudzu);
- (iv) Natural weed cover, cutlassed or mown.

83. *Grapefruit—NPK Trial at La Reunion, C.E.S.*—First applications of fertiliser were made to a randomised block manurial trial with NPK on Marsh grapefruit. These trees had been previously yield-recorded from 1947 onwards. The soil is a clay, typical of most citrus soils in the Colony. The trial involves combinations of N, P, and K at 6 lb. sulphate of ammonia, 12 lb. superphosphate, and 6 lb. muriate of potash respectively per tree per annum. First post-treatment yields will be obtained in 1951.

84. *Grapefruit—Varying Nitrogen Trial*.—A trial has been laid down on a yield-recorded block of grapefruit and is designed to give information on optimum dosages of nitrogen. All trees will be sprayed with zinc, as zinc deficiency is general on the clay soil involved. First applications of nitrogen, as sulphate of ammonia, were made in 1950 at the following annual rates per tree: Nil, 4 lb., 8 lb., and 16 lb.

85. *Cover Crop Trial*.—An observational plot, comprising permanent covers of grass, weeds, and legumes in citrus, was extended in 1950 to give sufficient replications for yield-recording. The area is in Marsh grapefruit, and the plots consist of (a) Control—natural weeds, (b) *Stylosanthes guyanensis*, (c) *Indigofera endecaphylla*, (d) Kudzu, and (e) *Ischaemum aristatum* (Toco or Tabaquite grass). All trees receive a standard dressing of 6 lb. sulphate of ammonia and a zinc spray. This trial provides a most striking visual contrast between trees on the grass plots and those on the leguminous plots—the former have sparse and yellowed foliage, symptomatic of N-deficiency, while the latter have a dense green foliage.

86. Mean yields, of select fruit only, from the older plots, are given below, in numbers of fruit per tree :—

		1948 (before planting weed cover)	1949 (first year)	1950 (second year)
Stylosanthes	...	483	407	657
Kudzu	...	560	278	741
Indigofera	...	515	242	348
Toco Grass	...	542	230	215

87. Controls were not provided until the plots were replicated in 1950. The above figures tend to show the depressing effect on yield of a grass cover competing for nitrogen. The *Indigofera* has given a very sparse cover, while the kudzu, sown from seed, took longer to become established than the *Stylosanthes* which was planted from slips. These facts are also indicated by the yield figures of grapefruit from the plots.

88. *Insect Pests*.—Adults of a species of *Epitrix* (a small dark flea-beetle) damaged newly-produced leaves of West Indian lime and of orange at St. Augustine Station with little intermission over a period of several months. Temporary control was maintained by repeated spraying with chlorinated hydrocarbon insecticides.

89. Periodic damage to young leaf-growth by aphids (*Toxoptera aurantii* Boyer de Fonsc.) was widespread but not serious. One unusual record was that of attack (on foliage) by larvae of the eucleid *Phobetron* sp.

Coconuts

90. *Fertiliser Trial*.—Two extensive fertiliser trials have been concluded at the Cocal and at Icacos but the data have not yet been analysed. A new fertiliser trial with NPK was laid down in an inland area at D'Abadie.

91. *Pests and Diseases*.—As in the previous year, the incidence, in an abnormal degree, of the Coconut Scale (*Aspidiotus destructor* Sign.), on trees where the ant, *Azteca chartifex* Forel, had built nests, was reported from the Point Radix area.

92. Commercial spraying of *Aspidiotus* resulted in effective control by oil emulsions, whether fortified or not with parathion thiophos. The ants are readily susceptible to treatment with Chlordane, but rapid and effective means of application, short of costly specialized equipment, is still wanted. Attempts to adapt small power-sprayers for such work met with little success.

93. In the area where the above operations were carried out, it is evident that their economic value is liable to be largely offset by the relatively low nutritional status of the trees. The environmental conditions responsible for such a status have not yet been investigated.

94. Possible methods of reducing loss of trees from Red Ring disease (the eelworm *Aphelenchoides cocophilus* Cobb) have remained under investigation throughout the year. A relatively wide range of compounds has been tested *in vitro* and one or two have been tried in the field to see how their field compared with their laboratory performance. Experiments in the field of systemic nematocides have so far done more to illuminate the problems than to solve them. At present, perhaps the prime need is for means of detecting the presence of eelworms before the reserves of the trees have been seriously depleted.

95. The association of Rhinoceros beetles with decaying palms was studied. It was concluded that, notwithstanding the potential abundance of their larvae in tissues heavily infested with *Aphelenchoides*, Rhinoceros beetles are not the major agent of dispersal in the area under observation.

Oil Palms

96. The plantings of *Eleais Guineensis* made in 1948, at El Carmen have continued to make good growth. Some plants have flowered this year, but only male flowers have been observed. It is noticeable that in the wetter regions of the plantation the palms are chlorotic and it is doubtful whether they will succeed there unless the drainage is improved.

Rice

97. *Swamp Rice*.—Experimental work on rice was concentrated at Freeman Road experimental plots, the two major trials carried out were concerned with fertiliser application and varietal studies. At Centeno, the 8 acres brought under cultivation in 1948 is still too uneven to produce accurate results. Water control on this land is also imperfect and, in a dry season, a dense weed growth results. At Freeman Road, water control is fairly good but the land is subject to flooding during heavy rains. During dry periods the water level could be maintained more adequately by the building of a sluice-gate on the exit channel. Facilities for more detailed experimental work at Freeman Road could be greatly improved by the erection of a permanent building with drying space and a small field laboratory.

98. It now seems fairly well-established that the application of fertilisers does little to improve the yield of padi in Trinidad when the return is above 2,000 lb. per acre. This year's experiments only serve to confirm this idea. Five different dressings of fertiliser were employed and two methods of application used.

99. Eleven varieties were selected for comparison, of these three were local in origin, four from Sierra Leone, three from British Guiana and one from the United States.

100. *Introductions*.—Small plots of varieties introduced from India and Ceylon were planted. Many of these varieties are reputedly non-photoperiodic. These varieties were as follows :—

Co. 22	T. 1276
Co. 23	As. D. 5
Co. 25	As. D. 6
Co. 26	P.T. 1310
T. 352	Vellai Illan Kalayan.

101. It is intended to study the reaction of these varieties in the second planting 1951-52. In 1950 sufficient seed was not available to carry out an extended trial. In most cases the grains are very small and it is unlikely that they will prove a popular addition to the local peasant varieties, but they might prove very useful in a breeding programme.

Annual Crops

102. The annual crop plots at El Carmen, Centeno, have been in poor condition during the year. Early in the season the whole area was inundated and had to be virtually abandoned from an experimental point of view. Most of the plots suffer from wet areas alongside the drains and an even crop is an impossibility. It has been decided to split some of the plots longitudinally and dig deeper drains, in the hope of effecting some improvement.

103. Yields of sunflower, castor oil and soya beans were negligible and in some instances even the seed was not recovered. Pigeon peas have stood up fairly well to the adverse conditions.

104. Corn, adlay and sorghum survived the floods and produced comparatively successful crops although even here yields were low.

Legumes

105. The following varieties of legumes have been received from Ceylon and are undergoing multiplication before going into trial as cover and forage crops :—

Crotalaria browneii

Tephrosia voglei

Pueraria phasealoides

Desmodium gyroides

D. ovalifolium.

Cotton

106. Plantings of Marie Galante cotton were made at Centeno and St. Augustine Station on the 25th and 26th of October respectively. Each plot measured half an acre. In both cases initial growth was good, although rather irregular. At both stations the irregularity of growth became more apparent as the season progressed. Supplying was done but most of these failed to take. Observations continue.

Kenaf

107. Considerable interest is being shown in kenaf (*Hibiscus cannabinus*) as a fibre crop. It is proving a useful substitute for jute in the hard fibre industry. So far, only a very limited area of kenaf was grown in Trinidad in a museum plot at the Imperial College of Tropical Agriculture. Seed has been obtained from this source and two plots established on departmental stations.

Sisal

108. A small experimental area of sisal (*Agave sisalana*) has been planted at La Reunion, Centeno. There is considerable evidence that sisal will grow in Trinidad but for good fibre production a well-marked dry season is necessary. A supply of bulbils has been requested from Kenya for more extended trials.

Hennequen

109. This fibre, another of the *Agave* family (*Agave furcroides*), is grown to a considerable extent in Jamaica and has possibilities in Trinidad. A supply of bulbils has been ordered which should prove sufficient for extended trial planting.

Bowstring Hemp and Pinguin

110. Two further fibres, bowstring hemp (*Sansevieria* sp.) and pinguin (*Bromelia pinguin*) have been planted in small plots at La Reunion, Centeno.

St. Augustine Station

111. *Revenue*.—Again a new high was set in 1950. Revenue for the past six years has been as follows :—

1945	...	...	...	...	\$24,031.90
1946	...	...	...	...	45,923.00
1947	...	...	...	...	44,164.95
1948	...	...	...	...	46,830.16
1949	...	...	...	...	55,963.34
1950	...	...	...	...	62,834.76

112. *Citrus Plants*.—Some 89,052 citrus plants were distributed during the year. Of this total, 334 were on 'free issue' to Government Departments, &c. Again the greatest demand was for Valencia orange plants, of which 51,857 were distributed.

113. Booking of applications for the 1951 distribution closed on the 30th November with orders for over 195,000 plants. Over 207,000 seedlings of sour orange and other rootstocks have been transplanted to take care of these orders.

114. *Avocados*.—A total of 10,182 avocado plants were distributed during 1950. Of these, 80 were on 'free issue'. Orders for 1951 distribution total around 8,000 plants.

115. *Mangoes*.—Some 3,650 grafted mango plants were distributed. Although this number is larger than the amount distributed in 1949 (2,724 plants), it is still far short of the demand. Young stocks are in good condition and it is hoped that there will be a substantial increase in distribution in 1951.

116. *Vegetable Seedlings and Ornamental Plants*.—Production of boxes of vegetable seedlings was 7,980 compared with 6,751 in 1949. Sales for 1950 were 5,403 as against 4,600 in 1949, and 77 boxes were distributed on 'free issue'. The demand for decorative plants in boxes was still very great. Some 5,326 boxes were produced. Of these 4,144 were sold and 281 were distributed free. The remainder was used in maintaining stock plants for a seed supply at this station. Sales of flowering trees, shrubs and hedge plants in bamboo pots amounted to 38,936 plants. 'Free issues' totalled 3,991.

117. *Orchard Crops*.—Eight pounds of sulphate of ammonia, in addition to 2 pounds of Sul-po-Mag, were applied to all grapefruit and orange trees. A total of 8,308 crates of Marsh, Foster and Duncan grapefruit were delivered to the Co-operative Citrus Growers' Association. In addition, some 30,388 fruit were sold locally.

118. Five hundred and nineteen crates of sweet oranges were delivered to the Co-operative Citrus Growers' Association. In addition some 92,689 fruit were sold locally. Revenue collected from fruits sold to the Co-operative Citrus Growers' Association was \$14,417.50.

119. *Field Crops*.—Some 27 tons of sugarcane were harvested and sold to the Imperial College of Tropical Agriculture. Over 3,000 plants of the seven Barbados varieties were sent to the Central Experiment Station for extension.

120. A large proportion of pigeon pea seed was spoilt by the abnormally wet weather at the beginning of the year. Two hundred and fourteen pounds La Seiba and 242 lb. Tobago pigeon pea seed were sold to the Marketing Division for seed purposes. As usual, small amounts of cowpea, wooly pyrol and soya beans were reaped and sold for seed purposes.

121. Around 30,000 lb. of Lisbon yams were harvested from approximately $1\frac{1}{2}$ acres. Some 17,000 lb. were sold to the Marketing Board as seed. In addition, nearly 500 lb. of Chinese yams were sold.

122. Twenty-two thousand, seven hundred and eighty-five pounds of dry shelled corn were produced from nine acres—an average of 2,532 lb. per acre. Some 7,910 lb. were sold to the Marketing Board, for seed and approximately 180 lb. were delivered on 'free issue' to the Extension Division. In addition, nearly 26,000 cobs of green corn were sold as food from interplantings in the citrus nurseries.

123. Nursery plants of swamp rice were established for the experimental programme of the Economic Botanist.

124. Commercial plantings of tomatoes were not as successful as in 1949, owing to the unfavourable weather conditions. Average yield was 4,000 lb. per acre as compared with 10,000 lb. in 1949.

125. The large-scale use of Sun Hemp (*Crotalaria juncea*) as a cover crop at this Station has aroused the interest of many agriculturists. In addition to the Station's requirements, over 1,000 lb. of seed have been distributed—800 lb. to Specialist Officers of the Central Experiment Station, and the remainder taken up by estate owners as a nucleus for their own seed supply. Over 50 lb. of other cover crop seed were made available to schools and demonstration stations.

SOIL SURVEY

126. The field surveys of the following areas have been completed during the year : Toco, Matelot, Guanapo, Aripo, Bronte Sugar Estates and surrounding areas.

127. Two thousand, six hundred and fifty-five routine determinations were completed during the year. The majority of these samples were carried out in connection with the *Soils of Central Trinidad* report.

LIVESTOCK

Animal Health

128. *Caribbean Veterinary Medical Association.*—A branch of the Caribbean Veterinary Medical Association was formed in the Colony during the year. Eleven veterinary surgeons, five in Government Service and six in private practice, &c., all joined this body. Capt. H. V. M. Metivier, Deputy Director (Animal Husbandry), who is the President of the parent body in Jamaica, was also elected President of this local branch and Dr. H. E. Williams, Veterinary Officer, Tobago, was appointed Honorary Secretary.

129. *Incidence of Disease in the Caribbean.*—The Caribbean Commission continued to issue, during the year, a useful monthly statement on the incidence of contagious and proclaimed diseases throughout the Caribbean area, compiled from reports submitted by the veterinary officers in territories within the terms of reference of the Commission. At the end of the year these returns were put together by the Commission in the form of an annual summary.

130. *Rabies Conference.*—The Pan-American Sanitary Bureau, a Division of the United Nations Health Organization, held a Caribbean Rabies Conference in Jamaica from the 26th August to 4th September, 1950, following an outbreak of rabies in Puerto Rico, and this Colony was represented by Dr. J. L. Pawan of the Health Department and the Deputy Director of Agriculture (Animal Husbandry). The chief recommendation was that rabies vaccination should be put into force wherever the disease was endemic but that in other territories, which were free from the disease, rabies should be controlled by strict quarantine restrictions and a minimum period of segregation of four months.

131. *Veterinary Diagnostic Laboratory.*—The arrival of various items of equipment during the year permitted an extension of this essential service which was by no means confined to the Department only. As before, the work undertaken fell under three main heads: Milk-testing, Pathological Investigation and Equine Pregnancy Diagnosis.

132. Every effort was again expended in the systematic routine examination of the milk produced on the Trinidad Stock Farm and milk purchased from peasants. Throughout the year resazurin grading, microscopic examination and butter-fat testing were carried out.

133. There was considerable extension of the pathological investigational work which included surveys to determine the incidence of Brucellosis and tick-borne diseases on the Trinidad Farm. Other work carried out was examinations in connection with the following: Johne's disease, tuberculosis, trichomoniasis, fowl cholera and faecal examination of Farm stock—chiefly calves, goats and sheep.

134. The Cuboni testing for the determination of equine pregnancy continued to be available to breeders and during the year a total of 16 tests were performed.

Proclaimed Diseases

135. *Foot and Mouth.*—This Government was informed, through the British Ambassador at Caracas and the Venezuelan Consul-General in Trinidad, that Foot and Mouth disease had been diagnosed in Venezuela—strain 'C'—during the month

of August and that there were 50,000 cattle infected. Precautions were at once taken and regulations made by the Governor in Executive Council, under the Diseases of Animals Ordinance, prohibiting the importation of cloven-footed animals and their products into this Colony from Venezuela. Early rumours that the disease had appeared in Columbia were not confirmed by the British Ambassador but, by January, 1951, definite occurrence had been reported.

136. *Tuberculosis*.—It was decided, following the recommendation of the Caribbean Livestock Conference, to employ the Bureau of Animal Industry (B.A.I.) tuberculin for testing Government and privately-owned animals and the results of tests carried on in the different classes of livestock in Government-owned animals, as compared with the results in 1949, when Canadian bovine tuberculin was used, were as follows:—

		No. of tests		No. of reactors		% of reactors	
		1950		1950		1950	1949
Cattle	...	...	552	...	38	6.8	2.6
Buffaloes	...	...	10	...	1	10	24
Swine	...	...	169	...	23	13.6	5.3
Goats	...	...	139	...	1	.7	1.7

Among 1,805 privately-owned dairy cows tested, chiefly in the rural districts around Port-of-Spain, there were 60 reactors—3.3 per cent. It was decided by the Health Department that in future all testing should be carried out by Government Veterinary Officers and that certificates for the sale of milk would only be given if such a test had been carried out.

137. The incidence of this disease in water buffaloes still continued to be high and in 134 tested on the sugar estates there were 34 reactors, or 25.3 per cent. The sugar plantations have been advised, both by this Department and their private veterinary staff, that they must segregate all reactors and every effort must be made to build up clean herds by regular testing as well as by the provision of racks and mangers for feeding these animals: The sugar companies claim that the slaughtering of reactors, especially oxen, would seriously interfere with their reaping operations.

138. *Rabies*.—Reference has already been made (paragraph 130) to the Conference on rabies held in Jamaica following an outbreak of this disease in Puerto Rico. Paralytic rabies, which occurs on the South American continent as well as in this Colony, was also fully discussed. No cases of paralytic rabies were confirmed during the year but the Veterinary Officers of the Department took steps to vaccinate animals, chiefly in the South-Eastern areas of the Colony, i.e., Mayaro and Rio Claro, where the incidence of bat-biting was high.

139. *Swine Fever*.—This disease occurred first of all in the central part of the Colony and in the West St. George area early in the year, and later spread to the North-Eastern and South-Eastern parts of Trinidad. There were 13 outbreaks altogether but none of these occurred in the Island Ward of Tobago. In order to control the export of animals from Trinidad to Tobago, it was necessary to extend the proclaimed areas so as to control the North-Western portion of the County of

St. George, which would include Port-of-Spain. That the disease was brought under control at the end of the year was due chiefly to the use of Crystal Violet Vaccine in areas surrounding centres of infection.

Non-Proclaimed Diseases and Pests

140. *Brucellosis*.—The cattle and goats at the Trinidad Stock Farm were blood-tested, the latter both to *Br. abortus* and *Br. melitensis*. There was one bovine reactor and the foetal fluid of the aborted foetus of an imported Anglo-Nubian doe, which subsequently died, reacted to melitensis antigen.

141. A total of 53 privately-owned animals were blood-tested—49 cattle and 4 goats—and of these there was one bovine specimen positive.

142. *Anaplasmosis and Piroplasmosis*.—Both of these diseases were encountered during the year; there was one case each of piroplasmosis and anaplasmosis and one with a mixed infection (anaplasmosis and piroplasmosis). The cattle section on the Trinidad Stock Farm was checked for this condition. Of a total of 188 slides examined, anaplasma were found in seven but all were negative for piroplasma.

143. *Calf Pneumonia and Scours*.—The new system of calf management on the Trinidad Stock Farm has given very satisfactory results and it is interesting to record that although the year was characterised by unusual rainfall the calves suffered no ill effects from exposure and there were no deaths among the baby calves.

144. *Johne's Disease*.—A case of Johne's disease was recorded during the year: typical lesions, from which were recovered acid-fast bacilli, were seen on post mortem examination.

145. *Trichomoniasis*.—Two Government dairy cows aborted under circumstances suggestive of this condition and in one case the Veterinary Officer North, Dr. Williams, was able to demonstrate in the foetal fluids. Previously this officer had also recovered trichomoniads from preputial swabbings of two service bulls, both of which were subsequently slaughtered. This is the first occasion on which this disease has been recorded in the Colony, but it is believed that the incidence is slight.

146. *Mastitis*.—There was a marked decline in the incidence of this disease during the year.

147. *Strangles*.—There were two cases of equine strangles reported this year.

148. *Ulcerated Lymphangitis*.—Two cases were reported and the incidence in mules on sugar estates is declining.

149. *Poultry Diseases*.—There were four outbreaks of fowl typhoid, one of infectious laryngotracheitis and two of fowl cholera reported and confirmed during the year.

150.—*Diseases of Dogs*.—There were 23 cases of distemper and four cases of leptospirosis.

151. *Nutritional Diseases.*—This condition was encountered among chicks on a commercial poultry farm and the diagnosis was supported by Dr. V. D. Blood of the Pan-American Bureau, Washington, and Dr. R. Allman, Nutritionist of the F.A.O., Washington—visitors to the Colony. The condition responded to Vitamin B treatment and was due to the chick starter rations, that were being fed, being low in riboflavin. Steps were taken to add 1 per cent. milk butter and 7 per cent. yeast to the ration.

External Parasites

152. The routine spraying of the Farm cattle stock was continued throughout the year and two new preparations were tried. One of these, an already-mixed B.H.C.—D.D.T. product made available through the courtesy of the Du Pont Company, United States America, gave good results but, in the light of currency restrictions and foreign exchange rates it was not deemed advisable to replace the home-mixed B.H.C.—D.D.T. product which is giving satisfactory results. The other preparation tried out was a straight B.H.C. product—Gammatox—which was made available by the local agents. The control afforded by this product, when used alone, was poor, and did not compare favourably with the results given when used in the combination B.H.C.—D.D.T.

153. There were 12 cases of sarcoptic mange recorded in the Colony during the year and the use of Benzyl Benzoate has given very good results.

Internal Parasites.

154. Routine anthelmintic treatment was carried out in respect of calves and goats, based on the findings of faecal examinations. The Phenothiazine dosages employed on the Farm for many years were increased with most satisfactory results.

155. The construction of the proposed dipping tank at the Trinidad Stock Farm, for tick control, was not undertaken during the year but a site was tentatively approved by the Water Biologist, Works and Hydraulics Department.

Animal Husbandry

156. *Conferences.*—A Caribbean Livestock Conference was held in the Colony, under the auspices of the Caribbean Research Council, early in the year and delegates from the four metropolitan countries, together with their observers, attended. There were also representatives from F.A.O., the Colonial Office, the Imperial College of Tropical Agriculture and the Inter-American Institute of Agricultural Sciences, Costa Rica.

157. Another conference on livestock production convened jointly by F.A.O. of the United Nations and the Inter-American Institute of Agricultural Sciences was held at Turrialba, Costa Rica, in October and the Deputy Director of Agriculture (Animal Husbandry) who was leader of the United Kingdom delegation was appointed Chairman of the Animal Husbandry section.

158. During the Livestock Conference held in the Colony, under the auspices of the Caribbean Research Council, this Department made arrangements for delegates and observers attending the Conference to visit, during two field days, the following livestock units:—

- (a) The Quarantine Station, Port-of-Spain;
- (b) Government Stock Farm, St. Joseph;
- (c) The Stock Farm of the Imperial College of Tropical Agriculture;
- (d) A District Station and a Breeding Unit of the Department of Agriculture;
- (e) A pen of breeding water buffaloes on a sugar plantation;
- (f) A dairy farm of a sugar company;
- (g) Two commercial piggeries;
- (h) A display of dairy goats by the Trinidad Goat Society;
- (i) Three commercial poultry farms;
- (j) A holding of a peasant farmer where a dairy farm, a piggery, poultry and dairy goats are maintained.

159. *Livestock Shows*.—The following livestock shows were held during the year:—

- (i) Trinidad Poultry Association's Fifth Annual Show during April at Port-of-Spain;
- (ii) Sangre Grande District Agricultural Society, September, at Sangre Grande;
- (iii) Seven Cane Farmers' and Peasants' Shows in the Sugar Belt areas during the months of September, October and November;
- (iv) Tobago District Agricultural Society, December, at King's Camp, Scarborough;
- (v) The Trinidad Goat Society's Ninth Annual Show, December, at Woodbrook, Port-of-Spain.

160. *Breed Improvement*.—Table VII records the services by improved sires at the Stock Farms, Trinidad and Tobago, and the District Breeding Units during 1950.

TABLE VII—SERVICES BY IMPROVED SIRES, 1950

Sire					Trinidad	Tobago	Total
Stallions to mares	...	...	...	...	37	28	65
Jacks to mares	...	...	...	...	24	49	73
Jacks to jennies	...	...	...	...	83	98	181
Bulls	...	...	...	...	1,649	159	1,808
Boars	...	...	...	...	203	87	290
Rams	...	...	...	...	—	57	57
Bucks	...	...	...	...	800	178	978

161. The services of imported sires to Government-owned animals on Farms and District Stations are not included in Table VII, nor are those of a number of pure-bred Sahiwal bulls which were made available in Tobago throughout the year on pastures, &c., at the following centres:—Mount St. George, Government Stock Farm, Lowlands, New Grange, Bon Accord, Friendship, Diamond, Kendall and

Richmond Plantations. This programme of work is intended to accelerate grading work of Sahiwal bulls on Tobago cattlekind. In Trinidad the standing of individual sires on loan to proprietors in various parts of the Colony was discontinued and it was decided instead to sell selected sires from the Stock Farm at a cheaper figure for breeding purposes and, secondly, to increase the number of breeding units.

162. An important contribution to livestock improvement was the holding of three auction sales of surplus livestock on the Stock Farms, two in Trinidad (March and November) and one in Tobago, in December.

163. At the Trinidad Stock Farm the following animals were disposed of at these two sales:—

TABLE VIII—STOCK SOLD, TRINIDAD STOCK FARM, 1950

Class of Animals					No.	Value
						\$ c.
Grade Holstein heifers	...	...	...	...	54	11,935 00
Grade Holstein bulls	...	...	...	...	3	655 00
Horses	...	...	...	...	6	1,275 00
Bucks	...	...	...	...	14	520 00
Does	...	...	...	...	16	787 00
Boars —Large Black	...	...	...	...	89	3,600 00
Gilts —Large Black and Berkshire	...	...	...	...		
Poultry —Roosters	...	...	...	...	66	412 00
—Hens	...	...	...	...	66	385 25
—Ducks and drakes	...	...	...	...	9	41 25
TOTAL	...	...	...	...	323	\$19,610 50

164. At the December sale of the Tobago Stock Farm the stock sold was as follows:—

TABLE IX—STOCK SOLD, TOBAGO STOCK FARM, 1950

Class of Animal					No.	Value
						\$ c.
Grade Sahiwal heifers	...	...	...	...	6	835 00
Grade Sahiwal bulls	...	...	...	...	2	201 00
Pure-bred Sahiwal bulls	...	...	...	...	2	600 00
Filly	...	...	...	...	1	305 00
Jenny donkeys	...	...	...	...	2	291 00
Bucks	...	...	...	...	3	72 50
Does	...	...	...	...	3	129 00
Rams	...	...	...	...	3	29 00
Ewes	...	...	...	...	6	88 00
Berkshire boars	...	...	...	...	2	27 00
Berkshire gilts	...	...	...	...	10	155 75
Large Black boars...	...	...	...	...	10	151 25
Large Black gilts	...	...	...	...	6	86 25
Poultry—cockrels	...	...	...	...	9	42 75
—hens	...	...	...	...	29	97 25
Doe rabbits	...	...	...	...	12	18 75
Buck rabbits	...	...	...	...	12	17 90
					118	\$3,147 40

165. In spite of these sales it was possible, during the year, to dispose, privately, of a number of pigs, 31 from the Trinidad and 83 from the Tobago Farm. Also sold privately by these two Farms were eight dairy bulls, five bucks, 70 rabbits and an appreciable number of poultry and eggs. Twenty-two cockerels were exchanged for common roosters owned by settlers on Government Land Settlements.

166. The special importations for breeding purposes, made in 1950, are listed below:—

TABLE X—IMPORTS FOR BREEDING, TRINIDAD, 1950

Class of Stock	Country of Origin			Importer
22 Thoroughbred horses	...	United Kingdom	...	Racing community
20 Thoroughbred horses	...	British West Indies	...	do.
1 French Canadian draft stallion	...	British West Indies	...	Department of Agriculture
1 Saanen buck	...	United Kingdom	...	Mr. C. B. Tywang
2 British Alpine bucks	...	United Kingdom	...	} Department of Agriculture
1 British Alpine doe	...	United Kingdom	...	
2 Anglo-Nubian bucks	...	United Kingdom	...	
2 Anglo-Nubian does	...	United Kingdom	...	
4 Wiltshire horned sheep— 2 rams and 2 ewes	...	United Kingdom	...	

167. *Cattle Management.*—The various changes in management outlined in the 1949 Report were maintained throughout the year with one or two additions. The most important of these was the removal of Zebu heifers from the herd in an attempt to halt reduction in the size of the animals through immature mating. Zebu heifers are not now bred under 2½ years of age. The other change worth mentioning was the extension of the practice of dehorning to include as many of the large group of heifers as deemed advisable. The new system of calf management was continued throughout the year with considerable success, as there were no deaths among the baby calves and the outdoor management did not affect the comfort of these young animals, in spite of the unusually heavy rainfall. The following table shows the number of births and deaths during the past four years:—

TABLE XI—CALF STATISTICS, TRINIDAD STOCK FARM

Year					Births	Deaths
1947	...	...	...	...	135	24
1948	...	...	...	...	152	21
1949	...	...	...	...	112	10
1950	...	...	...	...	80	—

168. In the grading work on the Trinidad Farm, observations seem to show the desirability of half-bred breeding (50 per cent. *Bos taurus*, 50 per cent. *Bos indicus*) as compared with three-quarter bred (75 per cent. *Bos taurus*, 25 per cent. *Bos indicus*) as the half-breds appear to be constitutionally more suited to climatic conditions.

169. At the Tobago Farm a dairy herd is being built up with Sahiwal cattle (pure-bred and grade) and a number of these cows were housed for the purpose of supplying milk to school children. The scheme will be extended next year when the hospital, other Government institutions and more schools will receive their supplies of processed milk from this source.

170. The dairy herd at the Trinidad Stock Farm was milked three times a day and the feeding of concentrates was stabilized at 4 lb. to every gallon of milk throughout the year. It was repeatedly demonstrated that milk production was largely governed by the availability and quality of the fodder and it was also interesting to observe that milk yielded over a ten-year period was somewhat higher in the dry season. Milk from 120 cows totalled 53,000 gallons, an average of 444 gallons per cow. The average yield per cow increased by 80 gallons between 1948 and 1949. Not only has this increase been maintained, but, in 1950, there has been a further 113 gallons per cow. A very encouraging feature of milk production was the yield of first calvers. Of 24, 18 gave 5,000 lb. in 305 days; three gave 4,500 lb. and three were below 4,000 lb.

171. The following table gives the comparative Farm production for the years 1947 to 1950:—

TABLE XII—MILK YIELD AT THE TRINIDAD STOCK FARM

Year				Average No. of Cows Milked daily	Total annual yield, lb.	Daily average yield per cow, lb.
1950	...	...	...	69	533,349	21
1949	...	...	...	74	453,236	17
1948	...	...	...	79	391,424	13
1947	...	...	...	80	407,265	14

172. *Horsekind Management.*—The question of equine breeding policy was reviewed during the year and certain recommendations, aimed at emphasizing mule production, were formulated and subsequently implemented. In line with these recommendations a new pure-bred French Canadian stallion (draft type) which was available for purchase at the Central Experiment Station, Antigua, was acquired in October. It was also decided to replace the Hunter thoroughbred stallion, "Bold Friar" which died at the Tobago Farm, following an injury, by a young draft type stallion, "Grayson" (by a thoroughbred stallion "Flotsam", out of a Percheron mare). In order to encourage the use of these stallions so that the size and bone of mares for mule breeding might be improved, the service fee was fixed at \$5 as compared with \$30 for the use of thoroughbred stallions.

173. *Pig Management.*—The Colony-house system of handling farrowing sows was initiated at the Trinidad Stock Farm and maintained throughout the year with satisfactory results. It was found that in the case of one litter reared under the

Colony-house system, the average young pig, at 55 days (weaning age) weighed $17\frac{1}{4}$ lb., whereas the average individual weight of another litter at 81 days, which was housed according to the old method, was $12\frac{1}{2}$ lb.

174. *Goat Management*.—A small scale experiment involving a different method of management was initiated during the year for the goats at the Trinidad Farm. The animals, instead of being confined in an enclosure with an impervious floor (concrete), were permitted freedom in a small grass enclosure where small portable houses, adapted from those used for the baby calves, were used to provide shelter. The results have been encouraging and it is proposed to extend this form of management still further next year.

175. *Poultry*.—The poultry section of the Trinidad Farm was transferred from its previous location, where it had been for many years, to a more suitable site in the paddock facing the dairy. Twenty runs were provided, 10 being put into immediate use and the remaining 10 reserved for rotation. In these 10 runs were placed five breeding units of the two breeds at present maintained on this Farm—White Leghorns and Rhode Island Reds.

176. *Pastures, Fencing, &c.*—Considerable attention was paid on the Trinidad Farm to land utilization with emphasis on the development of organized pasturage and the extension of soiling crops. Execution of the programme involved the construction of approximately 4,200 feet of drains, the construction of a large culvert and the grading of 50 acres at the western part of the Farm. With a view to improving the general outlay of the fodder fields for grazing, arrangements were made for the sub-division of the land on the western boundary into paddocks of 10-13 acres in size.

177. Paddocks for grazing as well as for soiling have been laid down with Elephant, Guinea and Para grasses and an attempt was made to secure seeds of Antigua Hay grass, *Andropogon*, for trial here. Further consideration was given to the important question of the development of legume-grass mixtures and the legumes tried were *Indigofera endecaphylla* and three small plots of Alfalfa. The latter were quite unable to compete with weeds and grasses and the expense of keeping pure stands seemed uneconomical. *Indigofera endecaphylla*, which was tried out on a much larger scale, showed much more adaptability to compete, but the question of its potential toxicity, as reported elsewhere, proved to be a disturbing factor.

178. During the year 136 grass fields were fenced at the Trinidad Farm and nine water troughs were constructed in the grazing paddock. At the Tobago Farm some work was started in extending grasses for soiling purposes and success has again been obtained in spreading *Pueraria*, *Teramnus*, and *Ipomoea* among the soiling grasses. It is proposed during 1951 to extend the planting of stool forming grasses in paddocks both for soiling and grazing. In view of the improvement in roughage quality and the greater use of molasses, coupled with the difficulty of procuring suitable iron salts locally at a reasonable cost, the inclusion of iron in the mineral mixture was discontinued. This change was endorsed by Dr. Allman, Nutritionist of F.A.O., Washington, D.C.

179. Dr. A. L. Jolly, Lecturer in Economics, Imperial College of Tropical Agriculture, at the request of the Department, initiated, in 1948, an economic study of the Trinidad Farm operations, with a view to determining milk-production costs. His report can be summarized as follows:—

The net cost of working the St. Joseph Farm during the year under review was \$46,000, or \$29,000 less than in 1949. The improvement over 1949 was due mainly to increase in income as follows:—

- (i) the sales of milk were \$8,000 more than the previous year;
- (ii) the sales of stock were \$22,000 higher.

The net cost of milk sold (including processing) was \$1.12 per gallon.

MARKETING AND FISHERIES DIVISION

180. *Produce—Market Conditions.*—Ground provisions were very plentiful during the first half year and at times glutted markets were relieved by traffickers disposing of substantial shipments to British Guiana. Markets were satisfactory during the remainder of the year with the exception of the month of November when supplies were only fair. The unusual weather which prevailed acted adversely on vegetable crops; in consequence, such quantities as came to market fetched good prices. Supplies of fruit were satisfactory up to June after which they became scarce. Both corn crops were affected by adverse weather conditions and only small quantities were seen in local markets. Green pigeon peas were plentiful in the first quarter; during the second quarter, small quantities of dry pigeon peas and black-eye peas were offered but these were insufficient to meet demand.

181. Purchases by the Division, for the year, amounted to 3,663,178 lb., valued at \$126,863.44, of which 665,092 lb. represented purchase of Jamaican corn valued \$49,682.34. Sales totalled 4,002,926 lb. for \$158,921.04 of which corn represented 1,229,156 lb. for \$76,811.43.

182. *Export of Gros Michel Bananas.*—After an initial period of trial shipments, a contract for two years was entered into with the Caribbean Fruit Co., of New Orleans, in April. This contract provided for lower prices during the summer months, when the United States market is usually well supplied. The reduction in price was not passed on to growers who continued to receive the same prices as were paid formerly.

183. Up to the end of July, fortnightly shipments were made but from the first shipment in August a change was introduced. The Island was divided into North and South zones from each of which alternate shipments were made. Thus, the fortnightly feature was maintained in that cutting was done in each zone fortnightly while shipments were made weekly. Thirty-three shipments were made during the year.

184. *Livestock Feeds*.—The prices of imported feeding stuffs from the United States and Canada continued to rise, and there was deterioration in the coconut meal supply. Moreover, corn supplies were scarce because of the heavy rains. The Marketing Board had imported some 900 tons of corn from British Honduras during the previous year and these supplies were distributed to cushion the effects of the shortage in local corn. Two hundred and fifty tons of cottonseed meal were imported from Antigua and St. Kitts to assist dairy owners in providing for their animals and all available supplies of rice bye-products were purchased from British Guiana. A portion of these supplies was made available to dairy owners who preferred to prepare their own feeds, and the Board was able, with the help of these stocks, to maintain their mixtures of prepared feeds without increasing prices.

185. In addition, approximately 22,368 tins of rice husks (310,168 lb.), purchased from rice mills, yielded 112,898 lb. rice bran and broken rice through an aspirator installed at the St. Joseph Depot. The yield of payable material was 36 per cent. This provided an efficient feeding stuff from material which would ordinarily have been wasted.

186. The following feeds and feeding stuffs were disposed of:—

				1949	1950
				Tons	Tons
Dairy Feed	...	...	...	474	557
Emergency Poultry Ration	...	...	...	66	173
Scratch Grain	...	...	...	185	146
Departmental Station, &c.	...	...	...	517	411
				1,242	1,287

187. *Seeds and Planting Material*.—The objective has always been to keep producers supplied with the kinds of seeds best suited to local conditions and in quantities to meet their requirements. Through long experience it has been found that seeds from the United States have been most suited but this source has been affected by the devaluation of sterling. So far, however, no satisfactory alternative supply has been discovered and in consequence the cost of seeds has been increased materially. The increased interest in banana production is reflected in the sales of local plant material in 1949 and 1950 as compared with 1948. The following comparison of 1950 sales with those of 1949 is of interest:—

				1949	1950
Imported seeds	...	...	...	\$13,270.21	\$17,017.60
Local plants	...	...	...	1,738.15	1,158.97
Insecticides	...	...	...	35.26	5.74

In collaboration with the Extension Division, arrangements were made to carry stocks of seeds, fertilisers and insecticides for sale at Demonstration Stations. This development was effective from October and it is yet too early to comment on the results.

188. *Fisheries*.—Following the recommendation of Dr. C. F. Hickling, Fisheries Adviser to the Secretary of State for the Colonies, Government created a Standing Advisory Committee on Fisheries and the following appointments were made:—

E. W. Leach, Esq., Director of Agriculture, Chairman, Honourable Victor Bryan, Minister of Agriculture and Lands, Honourable Sir Gerald Wight, Honourable H. E. Robinson and Norman Abdul, Esq., representing the fishermen.

During the absences from the Colony of the Honourable H. E. Robinson and Sir Gerald Wight, Major Gerald Liddelow was invited to temporary membership. After the return of the two members mentioned it was recommended, and agreed to by Government, that Major Liddelow be retained as an additional member.

189. The recommendations of the 1949 Committee, in connection with improvements at Cedros and Icacos, were put into effect and work on the recommended amenities was commenced but not completed. It is hoped that completion will be effected in 1951.

LAND SETTLEMENT

190. As in the previous year, no new settlements were established, but a further section of the Rio Claro Settlement, comprising 22 holdings, was laid out. Development of roads at the Bamboo Grove Extension Settlement was commenced and 10,000 feet of colas-surfaced cart road was completed. A piped water supply was also laid down along these roads. Routine maintenance of roads, water, Government-owned buildings, including settlers' houses, and other services continued on all leasehold settlements.

191. During 1950, 90 new tenants were signed on for allotments. Sixteen of these allotments had not been previously tenanted, but the remaining 74 were, and had either been repossessed or had been surrendered. There are now 1,719 allotments on leasehold settlements, 1,358 of which are tenanted, and 1,247 on freehold settlements, with 1,200 tenanted.

192. There are at the present time 560 houses constructed by settlers on leasehold allotments; 54 of these are, however, incomplete. These figures show an increase of 53 over the previous year, and could be taken as healthy, considering the substantial increase in the cost of building material during the year, and the limited quantities of suitable roofing material available.

193. The scarcity and high cost of stock feeds, on the one hand, and outbreaks of swine fever, fowl typhoid and fowl cholera, on the other, have contributed to a decline in the numbers of all classes of animals on leasehold settlements except in the case of cattle and sheep. The totals at year-end were:—horsekind 84; cattle 474; pigs 298; goats 299; sheep 29; rabbits 14; and poultry 10,619.

194. Settlers' groups continue to operate on many settlements, and there are Agricultural Credit Societies, Credit Unions, a Consumer Co-operative, Settlement Committees and Sports and Social Groups. Much more education is, however, necessary to sustain and develop these efforts.

STAFF NOTES

195. Mr. R. G. Fennah, Entomologist, visited British Guiana in March, at the request of the Government of that Colony, to investigate outbreaks of sugar cane froghopper, *Tomaspis flavilatera*.

196. Mr. D. M. Hanschell, formerly Botanist of the Barbados Department, was transferred to this Department as Sugar Agronomist as from 5th January, 1950.

197. Mr. R. E. Greaves, Agricultural Assistant, left the Colony on 16th September, to pursue animal husbandry studies in the Faculty of Agriculture, University of British Columbia, for one year.

198. Dr. J. L. Shannon relinquished the acting management of the Tobago Farm on 31st August.

199. Mr. D. B. Murray, Economic Botanist, was transferred to the Colonial Research Service and posted to Cacao Research at the Imperial College of Tropical Agriculture. Mr. L. Johnson, B.Sc., his successor, arrived and assumed duty on 4th September.

200. Dr. B. G. Montserin, Chief Scientific Officer, left for England on 9th September at the invitation of Cocoa, Chocolate and Confectionery Alliance, Ltd., whose conference he addressed. After the conference, Dr. Montserin visited research institutions in the United Kingdom and held discussions with Cocoa interests.

201. Dr. S. Bennett, who had served as Veterinary Officer, South, in a part-time capacity, since 1st October, 1948, left the Colony on 5th August on a few weeks leave. With the assumption of duty of Dr. H. E. Williams, D.V.M., M.Sc., on 17th July, Dr. Bennett's services were no longer required but the Department is very grateful for the assistance he has rendered.

202. The Extension Division suffered a great loss on 21st June in the death of Mr. T. Boodansingh, Senior Agricultural Assistant. Mr. Boodansingh, who joined as a student on 29th December, 1913, and had spent a little over 35 years in the Department, was a zealous worker and a strict disciplinarian who will be much missed.

203. Mr. G. C. Witt, Soil Survey Officer, was nominated to represent this Colony at the Conference of Soil Scientists in Puerto Rico. Mr. Witt left by air on the 29th March and returned on the 9th April.

204. Mr. Ganem Khan, Agricultural Assistant, left on the 8th May on one year's combined vacation and study leave in order to qualify for a Diploma in Agriculture at McDonald College, Canada.

205. The Director of Agriculture, Mr. E. W. Leach, attended a Conference of Directors of Agriculture in Jamaica, under the presidency of Mr. G. F. Clay, Agricultural Adviser to the Secretary of State for the Colonies, from 23rd May to 27th May. Capt. H. V. M. Metivier acted as Director during Mr. Leach's absence.

206. Dr. T. A. des Iles, Veterinary Officer, proceeded on 92 days vacation leave from 1st October to 31st December, and left the Colony on 16th December to spend 16 days in Grenada.

207. The Director of Agriculture and the Sugar Agronomist visited Jamaica from 21st to 31st October, and attended the Sugar Technologists' Conference there.

208. The Minister of Agriculture and Lands (Hon. V. Bryan) and the Honourable A. P. T. James were the delegates from Trinidad and Tobago to the Fourth West Indian Conference held at Curaçao from 25th November to 8th December. They were accompanied by Mr. Holman B. Williams, Deputy Director of Agriculture (Crop Husbandry) and Mr. H. N. Fahey as advisers.

209. Mr. E. B. Martyn, B.A., A.I.C.T.A., arrived in the Colony and assumed duty as Plant Pathologist on 16th October.

210. Mr. E. S. Capstick, B.A., A.I.C.T.A., arrived in the Colony and assumed duty as Senior Agricultural Officer on 8th December.

211. Mr. E. G. Benson, Agricultural Officer, was appointed Rice Officer as from 8th December.

212. Mr. F. A. Farrell, Agricultural Assistant, and Mr. M. Rocke, Road Overseer, Land Settlement, retired from the Service, on reaching the age limit on the 11th November.

PUBLICATIONS

213. An arrangement was reached with the Agricultural Society of Trinidad and Tobago by which this Department would submit a Supplement to the Quarterly Proceedings of the Society and then purchase reprints of the Supplement for sale, at a nominal price, in rural areas. There has been an increasing demand for these reprints and some 5,400 were distributed during the year. The more important original articles, submitted by members of the Department for the Supplement, are listed below:—

Housing and Management of Livestock, by J. L. Shannon, D.V.M.—*Supplement to the Proceedings of the Agricultural Society*, March, 1950, pp. 95-99. (Reprinted.)

The Main Vegetable Growing Area of Aranguez Estate, by R. Barrie-Smith, B.Sc., Dip. Agric., D.T.A.—*Supplement to the Proceedings of the Agricultural Society*, March, 1950, pp. 100-102.

Extracts from a Report on a Visit to the Lime Cultivations of Dominica, B.W.I., by M. N. Lucie-Smith, M.A., B.Sc.—*Supplement to the Proceedings of the Agricultural Society*, March, 1950, pp. 103-109.

Coconut Growing in Trinidad and Tobago, by D. B. Murray, B.A.—*Supplement to the Proceedings of the Agricultural Society*, June, 1950, pp. 201-208. (Reprinted.)

Some Notes on the Avocado, by M. N. Lucie-Smith, M.A., B.Sc.—*Supplement to the Proceedings of the Agricultural Society*, June, 1950, pp. 201-208. (Reprinted.)

Parasol Ants and their Life History and Methods for their Control, by R. G. Fennah, M.A., A.I.C.T.A.—*Supplement to the Proceedings of the Agricultural Society*, September, 1950, pp. 312-326.

The Citrus Rootstock Problems in Trinidad, by M. N. Lucie-Smith, M.A., B.Sc.—*Supplement to the Proceedings of the Agricultural Society*, September, 1950. pp. 327-334. (Reprinted.)

Tabaquite Grass, by R. Barrie-Smith, B.Sc., Dip. Agric., D.T.A.—*Proceedings of the Agricultural Society*, September, 1950, pp. 335-340. (Reprinted.)

The Purpose and Effects of Mechanical Tillage in Orchard Crops, by M. N. Lucie-Smith, M.A., B.Sc.—*Supplement to the Proceedings of the Agricultural Society*, December, 1950, pp. 437-441.

A Floating Nursery for Paddy, by E. G. Benson, B.Sc., A.I.C.T.A.—*Supplement to the Proceedings of the Agricultural Society*, December, 1950, pp. 442-443. (Reprinted.)

Tick Eradication in the British Virgin Islands, by A. V. Hall, D.V.M., D.V.P.H.—*Supplement to the Proceedings of the Agricultural Society*, December, 1950, pp. 444-448. (Reprinted.)

Bovine Tuberculosis, by T. A. des Iles, D.V.M., Dip. Agric.—*Supplement to the Proceedings of the Agricultural Society*, December, 1950, pp. 449-451. (Reprinted.)

214. The Department contributed an agricultural page to six issues of the monthly *Community Education*. This journal is widely read in rural areas and offers an excellent medium for popular articles and practical notes.

215. Mr. M. N. Lucie-Smith contributed "Citrus Production in Trinidad" to *The Peasant* and this was reprinted for distribution by the Department.

216. Mr. D. B. Murray, then Botanist, contributed "A Uniformity Trial with Swamp Rice" to *Tropical Agriculture*, Vol. XXVII, p. 105.

LEGISLATION

Ordinance No. 19 of 1950. Production of Cane (Amendment) Ordinance, 1950	Date	References	Remarks
Ordinance No. 24 of 1950. Sugar Industry Special Funds (Amendment) Ordinance, 1950	1st March, 1950	... Production of Cane Ordinance, 1946	Amendment of Section 5 (2) of Ordinance, No. 61 of 1946
Government Notice No. 50 of 1950. Sugar Quotas Order, 1950	4th May, 1950	... Sugar Industry Special Funds Ordinance 1948, No. 12 of 1948	Section 9A—Expenses of administering the Special Funds—added to Principal Ordinance
Government Notice No. 95 of 1950. Sugar Quotas (Amendment) Order, 1950	4th March, 1950	... Sugar Quotas Ordinance, Ch. No. 13	Allocation of local quotas from 1st February, 1950 to 31st January, 1951
Government Notice No. 262 of 1950. Production of Cane (Requisition of Returns) Order, 1950	18th April, 1950	... Sugar Quotas Ordinance, Ch. No. 13	Amendment to Sugar Quotas Order, 1950
*Gazette Notice No. 33 of 1950. Cess on cocoa	5th October, 1950	... Production of Cane Ordinance, 1946. No. 61 of 1946. Section 9 (7)	Submission by manufacturers to the Director of Agriculture, not later than 31st October 1950, returns in form prescribed relating to period 1st July, 1949 to 30th June, 1950
Gazette Notice No. 132 of 1950. Interim Price for Farmers' Canes, 1950	3rd January, 1950	... Cocoa Industry Ordinance, Ch. 23 No. 22, Section 14 as amended by Cocoa Industry (Amendment) Ordinance No. 5 of 1941	Cess on cocoa to be \$2.00 per 100 lb. from 6th January, 1950
Gazette Notice No. 264 of 1950	17th January, 1950	... Production of Cane Ordinance, 1946. Section 9 (1) (a)	Minimum rate of interim payment to be made by Sugar Manufacturers against the price of Farmers' Canes at \$6.00 per ton
Gazette Notice No. 1759. Distribution of Pool—Cocoa Crop 1949-1950	6th February, 1950	... Exportation of Sugar	Cancellation of Control of Imports and Exports Notices 167 and 171 of 1949 suspending exports of sugar and foodstuffs containing sugar
	28th October, 1950	... Distribution of Pool	Cocoa producers and dealers to submit sales slips not later than 28th October, 1951

*Several similar notices published throughout the year.

LEGISLATION—CONTINUED

Date	References	Remarks
VETERINARY		
Government Notice No. 18 of 1950, 21st January, 1950	...Proclamation No. 14 of 1949 prohibiting the export of swine and swine products due to an outbreak of swine fever in the Colony	Revocation of Proclamation No. 14 of 1949
Government Notice No. 88 of 1950, 13th April, 1950 Declaration of Swine Fever Infected Area	...Diseases of Animals Ordinance, Ch. 25, No. 2, Section 6	Definition of Swine Fever Infected Area at Talparo
Government Notice No. 98 of 1950, 18th April, 1950 Declaration of Swine Fever Infected Area	...Diseases of Animals Ordinance, Ch. 25, No. 2, Section 6	Definition of Swine Fever Infected Area at San Rafael
Government Notice No. 114 of 1950, 28th April, 1950 Declaration of Swine Fever Infected Area	...Diseases of Animals Ordinance, Ch. 25, No. 2, Section 6	Definition of Swine Fever Infected Area at Santa Cruz
Government Notice No. 121 of 1950, 5th May, 1950 Declaration of Swine Fever Infected Area	...Diseases of Animals Ordinance, Ch. 25, No. 2, Section 6	Definition of Swine Fever Infected Area at Matura
Government Notice No. 141 of 1950, 18th May, 1950 Declaration of Swine Fever Infected Area	...Diseases of Animals Ordinance, Ch. 25, No. 2, Section 6	Definition of Swine Fever Infected Area at Manzanilla
Government Notice No. 148 of 1950, 22nd May, 1950 Declaration of Swine Fever Infected Area	...Diseases of Animals Ordinance, Ch. 25, No. 2, Section 6	Definition of Swine Fever Infected Area at Petit Valley, Diego Martin
Government Notice No. 149 of 1950, 22nd May, 1950 Declaration of Swine Fever Infected Area	...Diseases of Animals Ordinance, Ch. 25, No. 2, Section 6	Definition of Swine Fever Infected Area at Moruga
Government Notice No. 168 of 1950, 21st June, 1950 Declaration of Swine Fever Infected Area	...Diseases of Animals Ordinance, Ch. 25, No. 2, Section 6	Definition of Swine Fever Infected Area at Tacarigua

LEGISLATION—CONTINUED

Government Notice No. 180 of 1950. Declaration of Swine Fever Infected Area	Date	References	Remarks
Government Notice No. 212 of 1950. Declaration of Swine Fever Infected Area	30th June, 1950	VETERINARY—Continued ... Diseases of Animals Ordinance, Ch. 25, No. 2, Section 6	Definition of Swine Fever Infected Area at Guayaguayare
Government Notice No. 182 of 1950. Slaughtering of Livestock (Amendment) Order, 1950	25th July, 1950	... Diseases of Animals Ordinance, Ch. 25, No. 2, Section 6	Definition of Swine Fever Infected Area at Sangre Grande
Government Notice No. 187 of 1950. Prohibition of Importation of Dogs and Feline Animals (Puerto Rico) Regulations, 1950	27th June, 1950	... Slaughtering of Livestock No. 2 Order, 1942	Revocation of 1942 Schedule and replacement by 1950 Schedule
Government Notice No. 229 of 1950. Importation of Animals (Foot and Mouth Disease) (Venezuela) Regulations, 1950	11th July, 1950	... Diseases of Animals Ordinance, Ch. 25, No. 2, Section 13	Prohibiting the importation of dogs and feline animals from Puerto Rico due to the prevalence of rabies in that country
Government Notice No. 237 of 1950. Quarantine (Importation of Animals) (Venezuela) Order, 1950	15th August, 1950	... Diseases of Animals Ordinance, Ch. 25, No. 2, Section 13	Prohibiting the importation of cloven-footed animals, carcasses of such animals, fodder, grain, litter and dung from Venezuela due to an outbreak of Foot and Mouth disease in that country
Government Notice No. 258 of 1950 Declaration of Swine Fever Infected Area	22nd August, 1950	... Quarantine (Amendment) Regulations, 1950	Prohibiting the importation of swine, dog, or feline animals, within the meaning of the Feline Animals Ordinance from Venezuela
Government Notice No. 276 of 1950 Declaration of Swine Fever Infected Area	21st September, 1950	... Diseases of Animals Ordinance, Ch. 25, No. 2, Section 6	Definition of Swine Fever at San Francisco Settlement
Government Notice No. 289 of 1950 Declaration of Swine Fever Infected Area	12th October, 1950	... Diseases of Animals Ordinance, Ch. 25, No. 2, Section 6	Definition of Swine Fever at Guayaguayare
Gazette Notice No. 239 of 1950. Veterinary Surgeons Register	10th November, 1950	... Diseases of Animals Ordinance, Ch. 25, No. 2, Section 6	Definition of Swine Fever Infected Area at Diego Martin and St. Ann's
Gazette Notice No. 522 of 1950	9th February, 1950	... Veterinary Surgeons (Registration) Ordinance, Ch. 25, No. 1	Register of Veterinary Surgeons
Ordinance No. 46 of 1950. Diseases of Animals (Amendment) Ordinance, 1950	16th March, 1950	... Veterinary Surgeons (Registration) Ordinance, Ch. 25, No. 1	Registration of Dr. A. V. Hall as a Veterinary Surgeon
	14th December, 1950	... Diseases of Animals Ordinance, Ch. 25, No. 2	Amendment to Section 12 (13A)—for securing the examination of goats for tuberculosis and the testing of goats with tuberculin

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